CALS TEST NETWORK

AFCTN Test Report 93-064

AFCTB-ID 93-019

Computer Graphics Metafile Transfer Using: Texas Instruments' Data

MIL-D-28003 (CGM)

Quick Short Test Report

15 March 1993

Prepared for

Electronic Systems Center

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Prepared By
Air Force CALS Test Bed
Wright-Patterson AFB, OH 45433

AFCTB Contact
Gary Lammers
(513) 427-2295

AFCTN Contact
Mel Lammers
(513) 427-2295

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Contents

1. Introduction

1.1 Background

The Department of Defense (DoD) Air Force Continuous Acquisition and Life-Cycle Support (CALS) Test Network (AFCTN) is conducting tests of the military standard for the Automated Interchange of Technical Information, MIL-STD-1840A, and its companion suite of military specifications. The AFCTN is a DoD sponsored confederation of voluntary participants from industry and government managed by the Electronic Systems Center (ESC).

The primary objective of the AFCTN is to evaluate the effectiveness of the CALS standards for technical data interchange and to demonstrate the technical capabilities and operational suitability of those standards. Two general categories of tests are performed to evaluate the standards; formal and informal.

Formal tests are large and comprehensive, which follow a written test plan, require specific authorization from the DoD, and may take months to prepare, execute, and report.

Informal tests are quick and short, used by the AFCTN technical staff, to broaden the testing base. They include representative samples of the many systems and applications used by AFCTN participants. They also allow the AFCTN staff to gain feedback from many industry and government interpretations of the standards, to increase the base of participation in the CALS initiative, and respond to the many requests for help that come from participants. Participants take part voluntarily, benefit by receiving an evaluation of their latest implementation (interpretation) gain experience using the standards, and develop increased confidence in them. The relults of informal tests are reported in Quick Short Test Reports (QSTRs) that briefly summarize the standard(s) tested, the hardware and software used, the nature of the test, and the results.

1.2 Purpose

The purpose of the informal test, reported in this QSTR, was to analyze Texas Instruments' interpretation and use of the CALS standards in transferring Computer Graphics Metafile data. Texas Instruments used its CALS Technical Data Interchange System to produce data, in accordance with the standards, and delivered it to the AFCTN technical staff on a 3.5" disk.

Texas Instruments submitted this 3.5" disk to test one CGM file from a new translator. The MIL-STD-1840 headers were not included as part of this test.

2. Test Parameters

Test Plan: AFCTB 93-019

Date of Evaluation: 15 March 1993

Evaluator:
George Elwood
Air Force CALS Test Bed
DET 2 HQ ESC/ENCP
4027 Colonel Glenn Hwy
Suite 300
Dayton, OH 45431-1672

Data Originator:
Michael Hurn
Texas Instruments
6500 Chase Oaks Blvd
P.O. Box 869305
Plano, TX 75086
(214) 575-3368

Data Description: Computer Graphics Metafile (CGM) Test
1 CGM file

Data Source System:

CGM

HARDWARE
Unknown

SOFTWARE
InterCAP Graphics *Illustrator 2 v7.810*

Evaluation Tools Used:

MIL-D-28003 (CGM)

SUN SparcStation 2

ArborText *cgm2draw*

Island Graphics *IslandDraw 3.0*

Cheetah Gold 486

Advanced Technology Center (ATC) *MetaView R 1.12*

ATC *MetaCheck R 2.05*

Software Publishing Corporation (SPC) *Harvard Graphics 3.05*

Inset Systems *HiJaak v2.1*

Inset Systems *HiJaak v1.0 Windows*

Micrografx *Designer 3.1*

Corel *Ventura Publisher*

Standards Tested:

MIL-D-28003

3. 1840A Analysis

3.1 External Packaging

The 3.5" disk arrived at the Air Force CALS Test Bed (AFCTB) enclosed in an overnight envelope. The exterior of the envelope was not marked with the magnetic media warning label, as required by MIL-STD-1840A, para. 5.3.1.3.

The 3.5" disk was not enclosed in a anti-static barrier bag or barrier sheet material, as required by MIL-STD-1840A, para. 5.3.1.2. Enclosed in the envelope was a packing list showing all files recorded on the 3.5" disk.

3.2 Transmission Envelope

The 3.5" disk received by the AFCTB did not contain MIL-STD-1840A files. The files were not named per the standard conventions.

3.2.1 3.5" Disk Format

The files on the 3.5" disk were not named per MIL-STD-1840A as this was not part of the requested test.

3.2.2 Declaration and Header Fields

The Document Declaration file and header fields were not evaluated as they were not included on the 3.5" disk.

4. IGES Analysis

No Initial Graphics Exchange Specification (IGES) files were included on the 3.5" disk.

5. SGML Analysis

No Standard Generalized Markup Language (SGML) files were included on the 3.5" disk.

6. Raster Analysis

No Raster files were included on the 3.5" disk.

7. CGM Analysis

The CGM file was evaluated using ATC's *MetaCheck* software with CALS options. This software reported no errors with the file meeting the CALS MIL-D-28003 specification. Note, this is not the most current version of the software.

The file was evaluated using the beta AFCTN *validcgm* utility. This program reported several errors.

The AFCTB has several tools for viewing CGM files. These tools are not used to generate a pass/fail but to report how commercially available software can handle the files. Many of these products are used in the development of technical publications and are good indicators of usability. The use of these products is not an endorsement nor an indication of CALS capability. All operations were performed using the default settings.

The file was viewed using ATC's *MetaView*. The displayed image appeared to be complete when compared to the provided hard copy. The text was complete and readable.

The file was converted using ArborText's *cgm2draw* utility. No errors were reported during the conversion. The resulting file was imported into Island Graphics' *IslandDraw*, displayed and printed. The resulting file appeared to be complete when compared to the provided hard copy.

The file was imported into Carberry's *CADLeaf* software. The displayed image and hard copy showed errors in the line types and some lines were missing.

The file was converted using XSoft's *CAPS cgm2ps* utility with no reported error. The resulting file was printed and compared to the provided file. Many lines and circles were noted as missing.

The file was imported into the Micrografx *Designer* without a reported error. The resulting image had many missing lines and lines added that did not appear to be on the provided copy.

According to Michael Harrison of Micrografx, "Micrografx is aware of the problems associated with reading these files and is working on a solution to be implemented in a future release of our products."

The file was imported into SPC's *Harvard Graphics 3.05* with reported line style error. The resulting image had many disjointed lines, missing lines and circles, and other notable errors.

The file was read into Inset Systems' *HiJaak for Windows* without a reported error. The resulting file consisted of many random lines throughout the image.

The file was imported directly into Island Graphics' *Island-Draw* without a reported error. The resulting image had many disjointed lines and circles. The image ran off the displayed and printed page.

The file was imported into Corel's *Ventura Publisher* without a reported error. The resulting image had many missing lines and circles. The text was missing.

The CGM file was reported as meeting the CALS MIL-D-28003 specification.

8. Conclusions and Recommendations

In summary, the 3.5" disk from Texas Instruments did not meet MIL-STD-1840A nor was the submitted file meant to be.

The 3.5" disk contained one CGM file. The file was reported as meeting MIL-D-28003 specification by ATC's *MetaCheck*. Of the eight CGM tools available in the AFCTB, only one software application was able to read and display the image correctly.

The 3.5" disk did not meet the CALS MIL-STD-1840A requirement, while the one CGM file was reported as meeting the CALS MIL-D-28003 specification.

9. Appendix A - Detailed CGM Analysis

9.1 File One

9.1.1 Parser Log MetaCheck

```
MetaCheck Version 2.05 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-91 CGM Technology Software
Execution Date: 03/15/93     Time:  07:25:22

Metafile Examined    : i:\9319\icap1.cgm

Pictures Examined    : All
Elements Examined    : All
Bytes    Examined    : All

======================== Trace Report ========================

Tracing not selected.

============= CGM Conformance Violation Report ==============

No Errors Detected

========== CALS CGM Profile (MIL-D-28003) Report ============

No profile discrepancies detected.

================ Conformance Summary Report =================

MetaCheck Version 2.05 -- CGM/MIL-D-28003 Conformance Analyzer
Copyright 1988-91 CGM Technology Software
Execution Date: 03/15/93     Time:  07:25:24

Name of CGM under test: i:\9319\icap1.cgm
Encoding              : Binary

Pictures Examined    : All
Elements Examined    : All
Bytes    Examined    : All

BEGIN METAFILE string : "cgm1.dwg"
METAFILE DESCRIPTION  : "InterCAP CGM version 1.30
                         ***
```

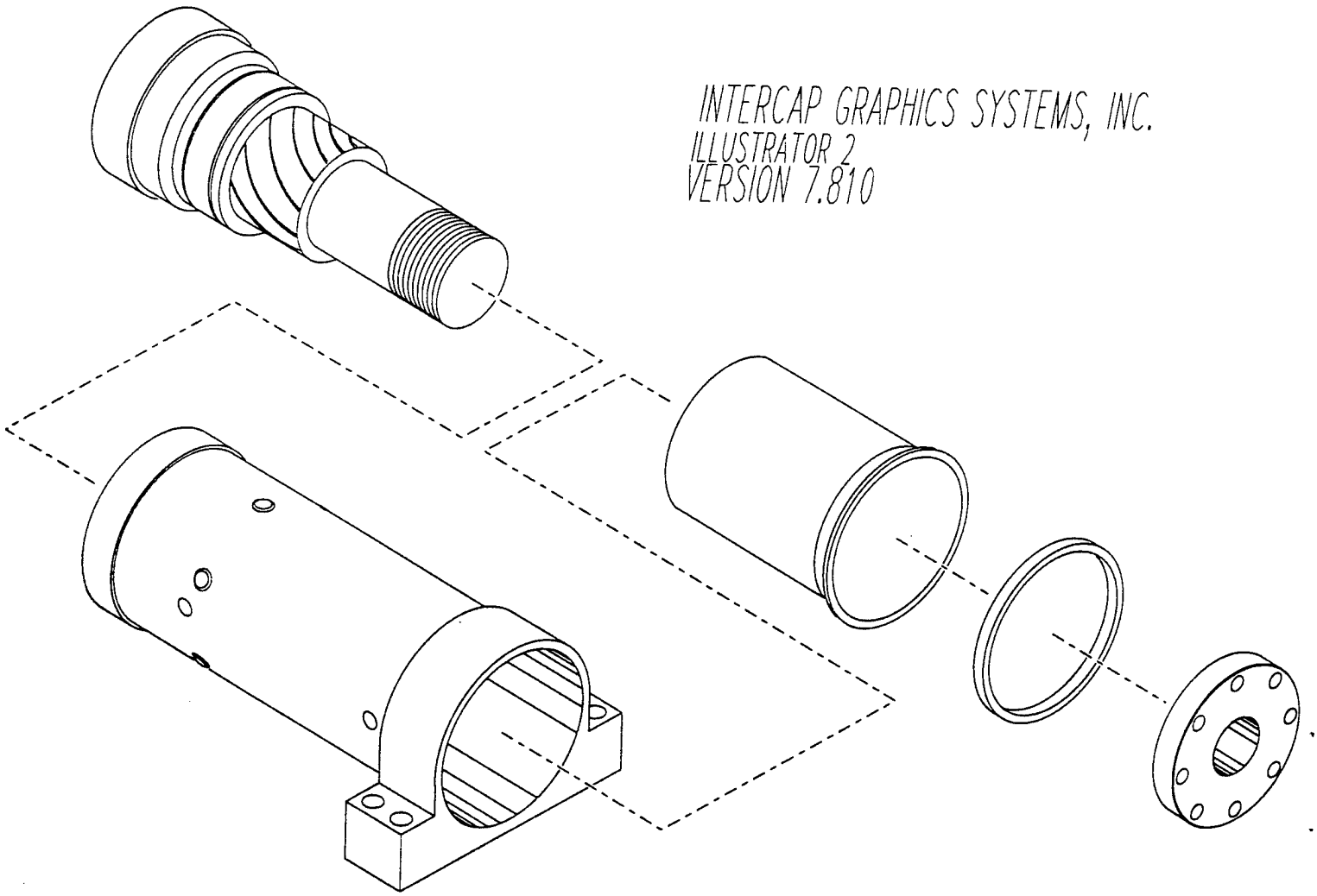
```
                        MIL-D-28003/BASIC-1"

Picture 1 starts at octet offset 250; string contains: "BIN 1"

Application data elements encountered in CGM

Conformance Summary  :  This file conforms to the CGM specification.

                        This file meets the CALS CGM Profile (MIL-D-28003).

Summary of Testing Performed and Errors Found:

          1 Pictures Tested
        189 Elements Tested
       3040 Octets Tested

                ================================
                |    No Errors Were Detected    |
                ================================

================ End of Conformance Report ================
```

9.1.2 validcgm Log

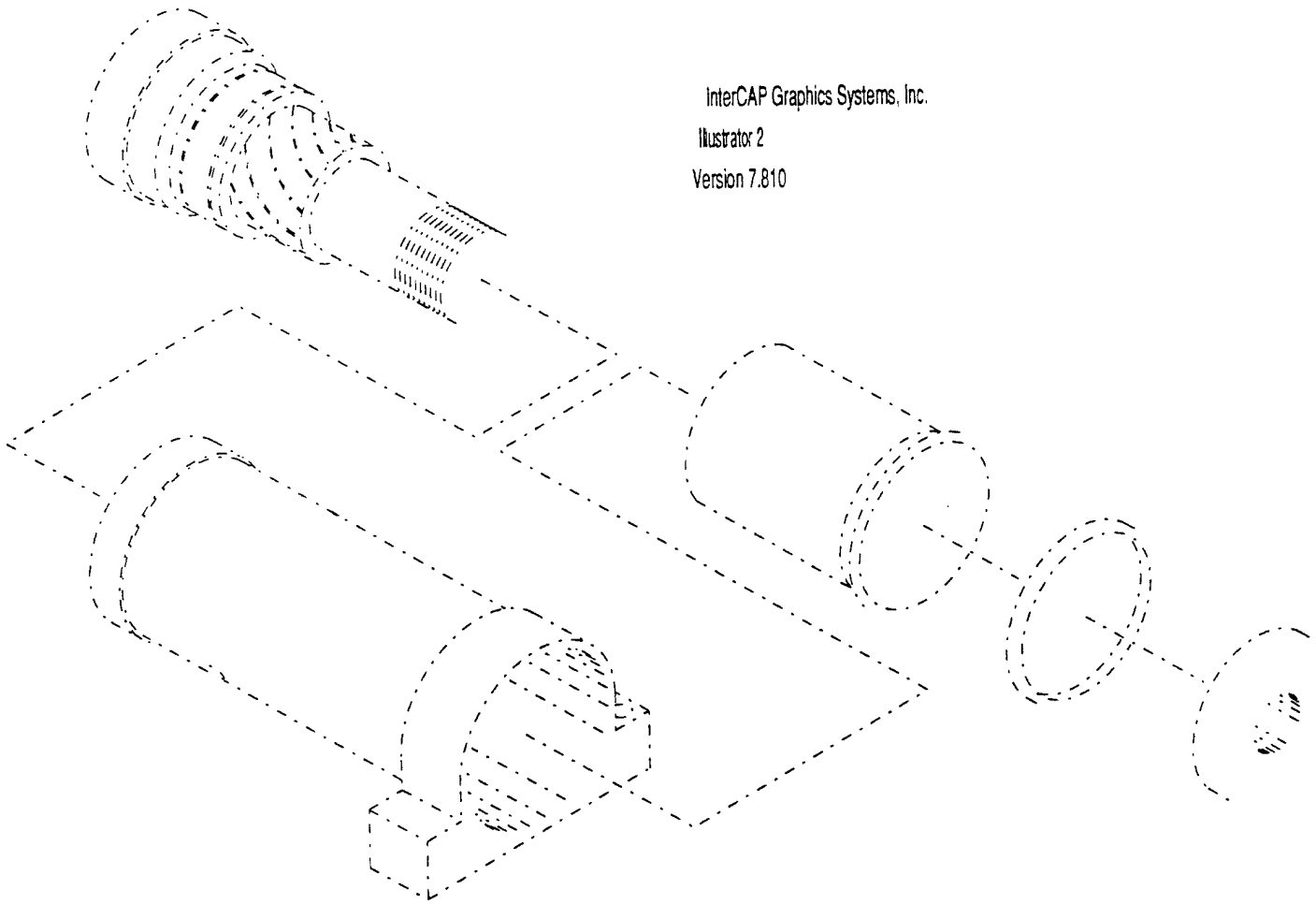
```
Analysis for file icap1.cgm using table table
ERROR: invalid times used per CGM (2), std B
ERROR: invalid times used per Picture (2), std B
(14, 198)         (1, 12, 10)     Metafile Defaults Replacement
ERROR: illegal in this state (2), std B
ERROR: required precursor (0, 3) not yet seen
(14.1, 0)         (2, 6, 8)       VDC Extent (0, 0) (32767, 32767)
ERROR: invalid times used per CGM (3), std B
ERROR: invalid times used per Picture (3), std B
(15, 210)         (1, 12, 4)      Metafile Defaults Replacement
ERROR: illegal in this state (2), std B
ERROR: required precursor (0, 4) not yet seen
(15.1, 0)         (5, 11, 2)      Text Precision  Stroke
(0, 1) occurred 1 time
(0, 2) occurred 1 time
(0, 3) occurred 1 time
(0, 4) occurred 1 time
(0, 5) occurred 1 time
(1, 1) occurred 1 time
(1, 2) occurred 1 time
(1, 3) occurred 1 time
```

(1, 4) occurred 1 time
(1, 5) occurred 1 time
(1, 6) occurred 1 time
(1, 7) occurred 1 time
(1, 8) occurred 1 time
(1, 9) occurred 1 time
(1, 10) occurred 1 time
(1, 11) occurred 1 time
(1, 12) occurred 3 times
(1, 12) occurred illegally 2 times
(1, 13) occurred 1 time
(1, 15) occurred 1 time
(2, 1) occurred 1 time
(2, 2) occurred 1 time
(2, 3) occurred 1 time
(2, 4) occurred 1 time
(2, 5) occurred 1 time
(2, 6) occurred 2 times
(2, 6) occurred illegally 1 time
(2, 7) never occurred, required by standard B
(3, 1) occurred 1 time
(4, 1) occurred 68 times
(4, 5) occurred 3 times
(4, 7) occurred 4 times
(4, 18) occurred 78 times
(5, 2) occurred 1 time
(5, 3) occurred 1 time
(5, 11) occurred 1 time
(5, 11) occurred illegally 1 time
(5, 15) occurred 1 time
(5, 16) occurred 1 time
(5, 18) occurred 1 time
(5, 22) occurred 1 time
(5, 23) occurred 1 time
(5, 28) occurred 1 time
(7, 2) occurred 1 time

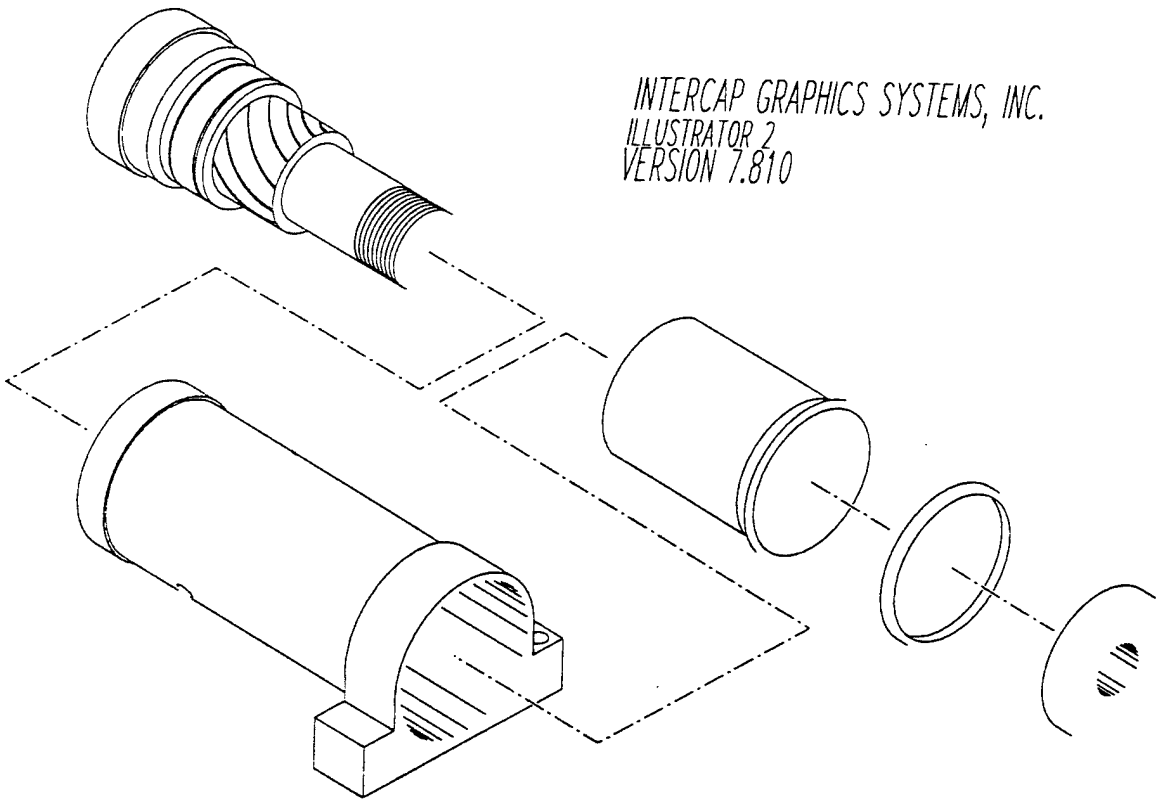
9.1.3 Output cgm2draw/IslandDraw



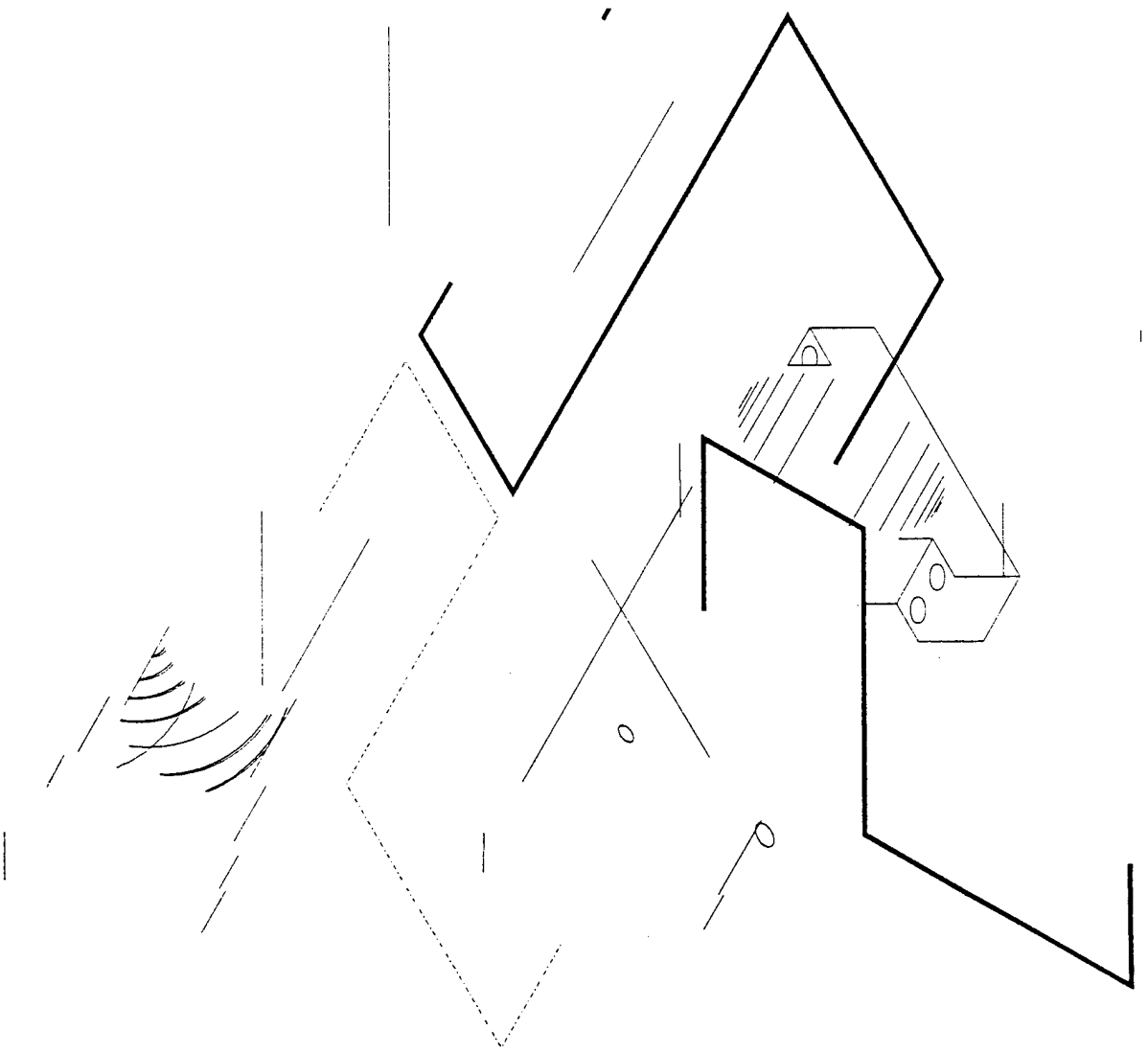
9.1.4 Output CADLeaf



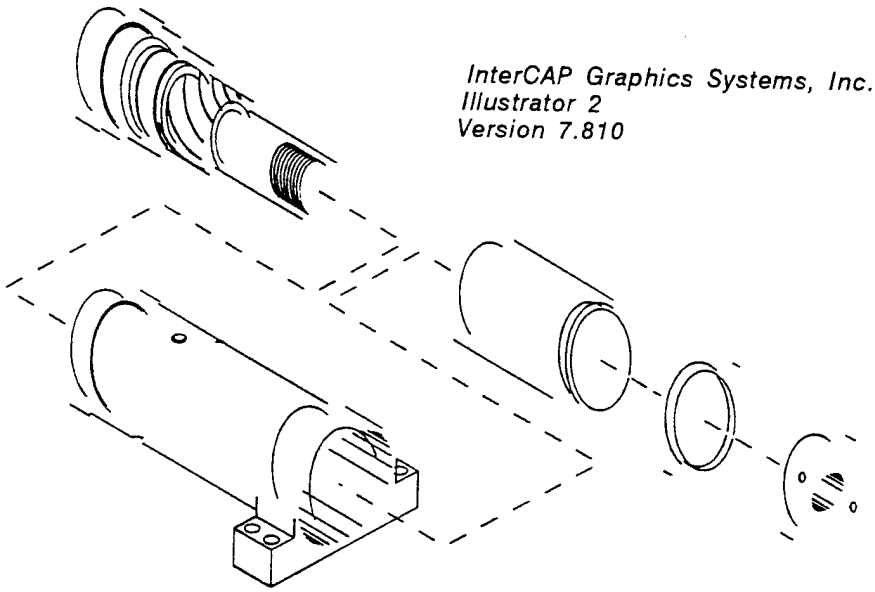
9.1.5 XSoft cgm2ps



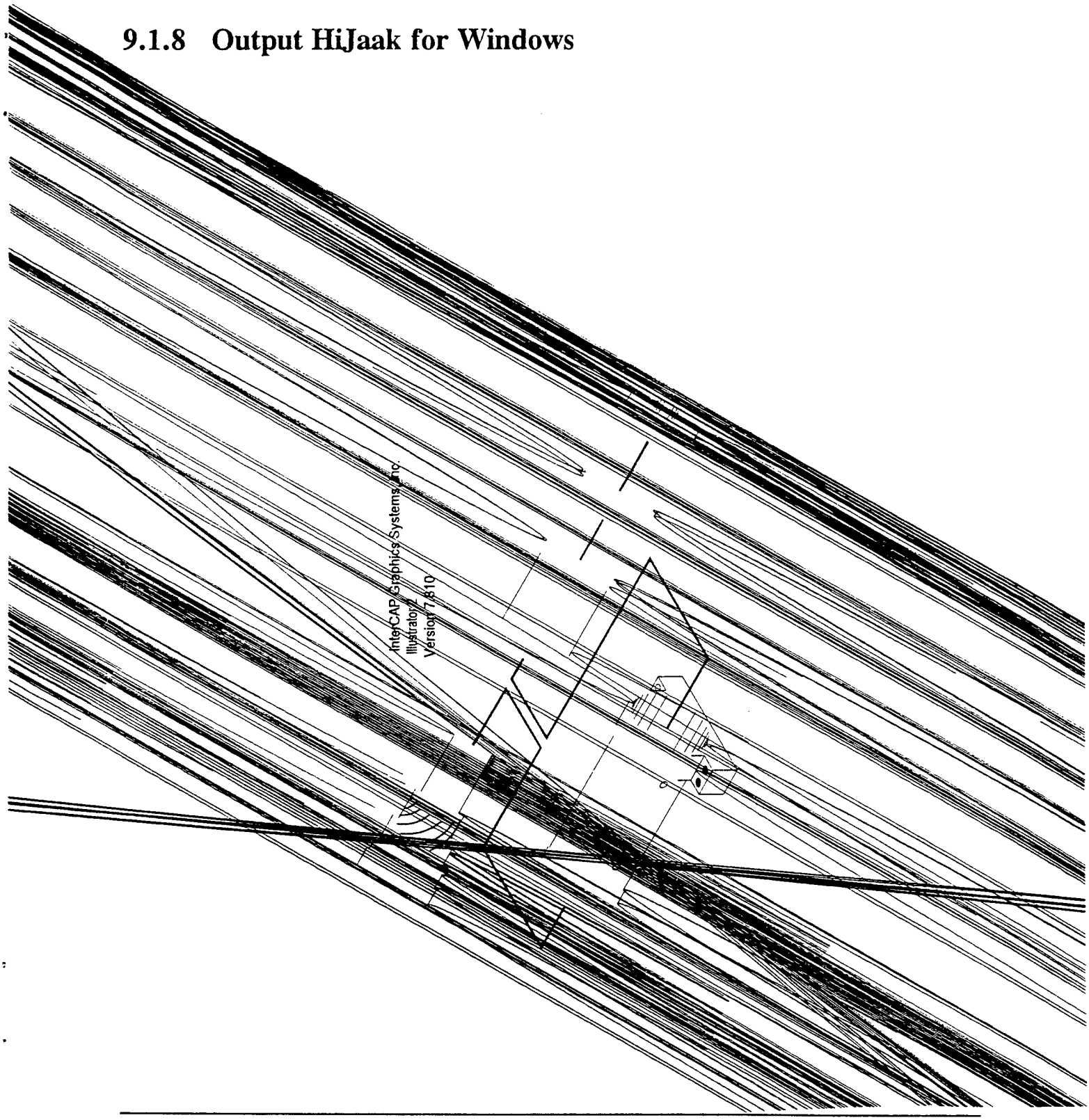
9.1.6 Micrografx Designer



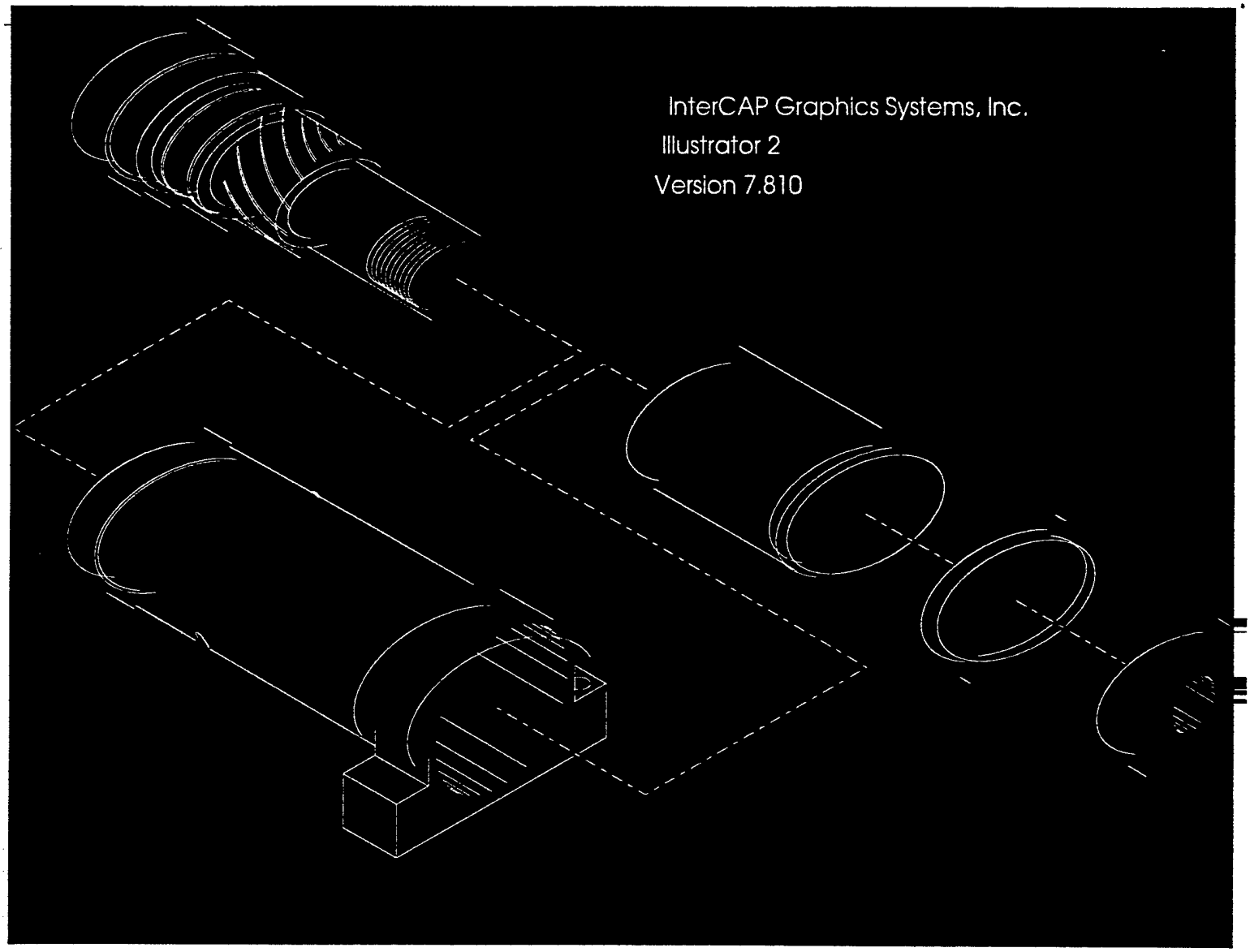
9.1.7 Output Harvard Graphics 3.05



9.1.8 Output HiJaak for Windows



9.1.9 Output IslandDraw



9.1.10 Output Ventura Publisher